Supplementary Material

Table S1. LAI measurements across growth stages

Date	02-Dec	03-Jan	10-Feb	12-Mar
Days after planting	35	67	105	135
M1L1	0.117	0.533	0.962	1.053
M1L2	0.195	1.001	1.612	2.002
M2L1	0.104	0.494	0.832	0.975
M2L2	0.182	0.936	1.56	1.859

Data and analysis related Crop Physiological Responses in the Result section :

Table S2. Full ANOVA Table

Source	Df	Sum Sq	Mean Sq	F value	Pr(>F)
(M1, M2) × (L1, L2)	3	2,204,118	734,706	27.85	0.000138
Residuals	8	211,020	26,378		

Table S3. Tukey HSD Comparison Table

Comparison	Difference	Lower CI	Upper CI	p-value
M1L2–M1L1	+685.72	+261.06	+1110.38	0.0038 **
M2L1–M1L1	–514.29	–938.95	–89.63	0.0196 *
M2L2–M1L1	+171.43	–253.23	+596.09	0.592
M2L1–M1L2	–1200.01	–1624.67	–775.35	<0.001 ***
M2L2–M1L2	–514.29	–938.95	–89.63	0.0196 *
M2L2–M2L1	+685.72	+261.06	+1110.38	0.38

Table S4. Summary

Treatment	Irrigation	Planting	Mean Yield ± SD	Significance
M1L1	25%	Single	5485.76 ± 160.39	b
M1L2	25%	Double	6171.48 ± 165.51	a
M2L1	50%	Single	4971.47 ± 161.19	c
M2L2	50%	Double	5657.19 ± 162.51	b

Table S5. Absolute accumulated values of E and T at different growth stages under the studied treatments.

treatment	Day after planting	E (cm)	T (cm)
M1L1	35	6.95	0.5
	67	7.14	2.71
	105	6.91	5.34
	135	5.24	4.61
M1L2	35	6.67	0.78
	67	5.4	4.45
	105	4.8	7.45
	135	2.96	6.89
M2L1	35	6.97	0.48
	67	7.34	2.51
	105	7.44	4.81
	135	5.49	4.36
M2L2	35	6.7	0.75
	67	5.61	4.24
	105	4.8	7.45
	135	3.22	6.63

Analysis of variance (ANOVA) for measured variables, including degrees of freedom, sum of squares, mean squares, F-values, and p-values for the main effects of irrigation regime (D), planting pattern (L), and their interaction (D × L).

Table S6. Dry Biomass (g plant^{-1})

Source of Variation	**df**	**SS**	**MS**	**F**	**p-value**
Replication (R)	2	348.67	174.33	9.93	—
Irrigation Regime (D)	1	30.08	30.08	1.71	0.238 (ns)
Planting Pattern (L)	1	140.08	140.08	7.98	0.030 **
Interaction (D×L)	1	0.75	0.75	0.04	0.843 (ns)
Residual	6	105.33	17.56		
Total	11	624.92			

Treatment Means:[1]

Treatment	Dry Biomass
M1L1	34.70 g
M1L2	31.00 g
M2L1	27.30 g
M2L2	24.70 g

LSD (5%): Main effect = 5.92 Interaction = 8.37

Table S7. Root Depth (cm)

Source of Variation	df	SS	MS	F	p-value
Replication (R)	2	8.366	4.183	3.93	—
Irrigation Regime (D)	1	3.597	3.597	3.38	0.116 (ns)
Planting Pattern (L)	1	1.993	1.993	1.87	0.220 (ns)
Interaction (D×L)	1	0.261	0.261	0.25	0.638 (ns)
Residual	6	6.387	1.065		
Total	11	20.605			

Treatment Means:

Treatment	Root Depth
M1L1	23.81 cm
M1L2	22.42 cm
M2L1	24.33 cm
M2L2	23.53 cm

LSD (5%): Main effect = 1.45 Interaction = 2.06

Table S8. Plant Height (cm)

Source of Variation	df	SS	MS	F	p-value
Replication (R)	2	12.87	6.44	0.14	—
Irrigation Regime (D)	1	9.36	9.36	0.20	0.669 (ns)
Planting Pattern (L)	1	57.20	57.20	1.23	0.309 (ns)
Interaction (D×L)	1	3.00	3.00	0.06	0.808 (ns)
Residual	6	277.96	46.33		
Total	11	360.40			

Treatment Means:

Treatment	Plant Height
M1L1	74.90 cm
M1L2	74.10 cm
M2L1	71.50 cm
M2L2	68.70 cm

LSD (5%): Main effect = 9.62 Interaction = 13.60

Table S9. Grain Yield (kg ha^{-1})

Source of Variation	df	SS	MS	F	**p-value**
Replication (R)	2	13,390	6,695	0.20	—
Irrigation Regime (D)	1	1,410,636	1,410,636	42.83	<0.001 **
Planting Pattern (L)	1	793,483	793,483	24.09	0.003 **
Interaction (D×L)	1	0	0	0.00	1.000 (ns)
Residual	6	197,631	32,938		
Total	11	2,415,139			

Treatment Means:

Treatment	Yield
M1L1	5,486 kg ha^{-1}
M1L2	6,171 kg ha^{-1}
M2L1	4,971 kg ha^{-1}
M2L2	5,657 kg ha^{-1}

LSD (5%): Main effect = 256.4 Interaction = 362.6